

List of Claims

1. (currently amended) A method of improving accuracy of a fuel injection event in a common rail fuel injection system, comprising the steps of:

sensing rail pressure at a predetermined fixed engine angle before top dead center for an engine cylinder, which is before a start of control signal for a succeeding injection event for an injector of the engine cylinder, but after an end of control signal of an immediately preceding injection event for a different injector of a different engine cylinder; and

determining a succeeding injection event control signal for the injector of the engine cylinder based at least in part on the sensed rail pressure from the sensing step.

2. (original) The method of claim 1 wherein said sensing step is performed between rail pressure recovery events.

3. (cancelled)

4. (cancelled)

5. (previously presented) A method of improving accuracy of a fuel injection event in a common rail fuel injection system, comprising the steps of:

determining a timing at which to perform a rail pressure sensing event;

sensing rail pressure at least a predetermined time before a start of control signal for a succeeding injection event for an injector of an engine cylinder, but after an end of control signal of an immediately preceding injection event for a different injector of a different engine cylinder;

determining a succeeding injection event control signal for the injector of the engine cylinder based at least in part on the sensed rail pressure from the sensing step; and

said determining step includes a step of setting the timing of a rail pressure sensing event at a fixed predetermined angle before top dead center for the engine cylinder.

6. (original) The method of claim 5 wherein said setting the timing step includes a step of providing a marker on a rotating component of an engine.

7. (previously presented) A method of improving accuracy of a fuel injection event in a common rail fuel injection system, comprising the steps of:

sensing rail pressure at least a predetermined time before a start of control signal for a succeeding injection event for an injector of an engine cylinder, but after an end of control signal of an immediately preceding injection event for a different injector of a different engine cylinder;

determining a succeeding injection event control signal for the injector of the engine cylinder based at least in part on the sensed rail pressure from the sensing step; and

said sensing step is performed a fixed predetermined angle before top dead center of the engine cylinder.

8. (cancelled)

9. (currently amended) A fuel injection system comprising:

a common rail containing a pressurized fluid;

a plurality of fuel injectors with inlets fluidly connected to said common rail; and

an electronic control module operably coupled to said fuel injectors and including a rail pressure determinator operable to determine rail pressure at a fixed predetermined engine angle before top dead center of an engine cylinder, which is before a start of control signal for a succeeding injection event for an injector of the engine cylinder, but after an end of control signal of an immediately preceding injection event for a different injector of a different engine cylinder, and being operable to determine a succeeding injection event control signal for the injector based at least in part on a single rail pressure value, which is the determined rail pressure.

10. (original) The fuel injection system of claim 9 wherein said electronic control module includes a rail pressure sensing event timing determinator.

11. (previously presented) A fuel injection system comprising:

a common rail containing a pressurized fluid;

a plurality of fuel injectors with inlets fluidly connected to said common rail;  
an electronic control module operably coupled to said fuel injectors and including a rail pressure determinator operable to determine rail pressure at a rail pressure sensing event timing, which is at least a predetermined time before a start of control signal for a succeeding injection event for an injector of an engine cylinder, but after an end of control signal of an immediately preceding injection event for a different injector of a different engine cylinder;  
said electronic control module includes a rail pressure sensing event timing determinator; and  
said rail pressure sensing event timing determinator includes an engine angle determinator operable to determine ~~whether~~ when an engine is at a predetermined fixed angle before top dead center for the engine cylinder.

12. (original) The fuel injection system of claim 11 wherein said engine angle determinator includes a marker reader algorithm.

13. (original) The fuel injection system of claim 11 wherein said predetermined fixed angle is based at least partly on succeeding injection event data and engine speed.

14. (original) The fuel injection system of claim 13 wherein said electronic control module includes a map of said predetermined fixed angle versus succeeding injection event timing and engine speed.

15. (cancelled)

16. (currently amended) An article comprising:  
a computer readable data storage medium;  
a rail pressure determinator stored on the medium and being operable to determine rail pressure at a predetermined fixed engine angle, which is before a start of control signal for a succeeding injection event for an injector of an engine cylinder, but after an end of control signal of an immediately preceding injection event for a different injector of a different cylinder; and

a control signal determination algorithm stored on the medium and being operable to determine a succeeding injection event control signal for the injector of the engine cylinder based at least in part the sensed rail pressure generated by said rail pressure determinator.

17. (original) The article of claim 16 including a rail pressure sensing event timing determinator stored on said medium.

18. (currently amended) An article comprising:

a computer readable data storage medium;

a rail pressure determinator stored on the medium and being operable to determine rail pressure at a rail pressure sensing event timing, which is at least a predetermined time before a start of control signal for a succeeding injection event for an injector of an engine cylinder, but after an end of control signal of an immediately preceding injection event for a different injector of a different engine cylinder; and

a control signal determination algorithm stored on the medium and being operable to determine a succeeding injection event control signal for the injector of the engine cylinder based at least in part on a sensed rail pressure generated by said rail pressure determinator;

a rail pressure sensing event timing determinator stored on said medium; and  
said rail pressure sensing event timing determinator includes an engine angle determinator operable to determine ~~whether~~ when an engine is at a predetermined fixed angle before top dead center for the engine cylinder.

19. (original) The article of claim 18 wherein said engine angle determinator includes a marker reader algorithm.

20. (original) The article of claim 19 including a map of said predetermined fixed angle versus succeeding injection event timing and engine speed stored on said medium.